

WHAT IS CLAIMED IS:

1. An echo canceling system for a full-duplex communication system comprising:

5 a sound characteristics detecting portion for detecting sound characteristics information of an echo path seen from a speaker side; and

an echo canceling processing portion for canceling an echo included in a signal returned from a system on a conversation partner side based on the sound characteristics information detected by the sound characteristics
10 detecting portion;

wherein those portions are installed in a communication system not on the conversation partner side but on the speaker side.

2. The echo canceling system according to claim 1 further comprising
15 an adjusting portion for receiving a tuning signal of an echo canceling processing by a speaker, wherein the echo canceling processing portion cancels the echo using the tuning signal in addition to the sound characteristics information detected by the sound characteristics detecting portion.

20 3. The echo canceling system according to claim 2, wherein the sound characteristics detecting portion comprises a signal generating portion for generating a sound characteristics detecting signal, which serves as a reference signal, and

25 before starting a conversation, the sound characteristics detecting portion detects the sound characteristics information of the echo path seen from the speaker side using the sound characteristics detecting signal and a response signal returned from the conversation partner side.

30 4. The echo canceling system according to claim 3, wherein, in detecting the sound characteristics information of the echo path by the sound

characteristics detecting portion, a threshold and a correlation search range with respect to a correlation value between the reference signal in the system on the speaker side and the response signal returned from the conversation partner side can be adjusted.

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5. The echo canceling system according to claim 2, wherein a voice signal inputted during a conversation is regarded as a reference signal, and the sound characteristics detecting portion detects the sound characteristics information of the echo path seen from the speaker side using the voice signal and a response signal returned from the conversation partner side.

6. The echo canceling system according to claim 5, wherein, in detecting the sound characteristics information of the echo path by the sound characteristics detecting portion, a threshold and a correlation search range with respect to a correlation value between the reference signal in the system on the speaker side and the response signal returned from the conversation partner side are adjusted.

7. The echo canceling system according to claim 2, wherein an echo canceling signal used in the echo canceling processing of the echo canceling processing portion is divided into a delayed part and a signal part following the delayed part, and

the echo canceling processing portion includes a delay filter for providing a delay corresponding to the delayed part and a signal filter for generating a signal corresponding to the signal part.

8. The echo canceling system according to claim 2, wherein the system on the speaker side comprises a loudspeaker and a plurality of microphones and performs a synchronous addition of input voice signals of the plurality of the microphones with respect to a direction of the speaker so as to enhance a voice signal.

9. The echo canceling system according to claim 2, wherein the system on the speaker side comprises a loudspeaker and a microphone array or a plurality of microphones and performs a synchronous subtraction of input voice signals of the microphone array or the plurality of the microphones with respect to a direction of the loudspeaker so as to cancel out an echo signal outputted from the loudspeaker.

10. The echo canceling system according to claim 2, wherein the speaker can choose execution or suspension of the echo canceling processing by the echo canceling processing portion and of the sound characteristics detecting processing of the echo path by the sound characteristics detecting portion.

11. The echo canceling system according to claim 1, wherein the sound characteristics detecting portion comprises a signal generating portion for generating a sound characteristics detecting signal, which serves as a reference signal, and

before starting a conversation, the sound characteristics detecting portion detects the sound characteristics information of the echo path seen from the speaker side using the sound characteristics detecting signal and a response signal returned from the conversation partner side.

12. The echo canceling system according to claim 11, wherein, in detecting the sound characteristics information of the echo path by the sound characteristics detecting portion, a threshold and a correlation search range with respect to a correlation value between the reference signal in the system on the speaker side and the response signal returned from the conversation partner side can be adjusted.

13. The echo canceling system according to claim 1, wherein a voice signal inputted during a conversation is regarded as a reference signal, and the sound characteristics detecting portion detects the sound

characteristics information of the echo path seen from the speaker side using the voice signal and a response signal returned from the conversation partner side.

5 14. The echo canceling system according to claim 13, wherein, in
detecting the sound characteristics information of the echo path by the sound
characteristics detecting portion, a threshold and a correlation search range
with respect to a correlation value between the reference signal in the
system on the speaker side and the response signal returned from the
10 conversation partner side are adjusted.

15 15. The echo canceling system according to claim 1, wherein an echo
canceling signal used in the echo canceling processing of the echo canceling
processing portion is divided into a delayed part and a signal part following
the delayed part, and

the echo canceling processing portion includes a delay filter for
providing a delay corresponding to the delayed part and a signal filter for
generating a signal corresponding to the signal part.

20 16. The echo canceling system according to claim 1, wherein the system
on the speaker side comprises a loudspeaker and a plurality of microphones
and performs a synchronous addition of input voice signals of the plurality of
the microphones with respect to a direction of the speaker so as to enhance a
voice signal.

25 17. The echo canceling system according to claim 1, wherein the system
on the speaker side comprises a loudspeaker and a microphone array or a
plurality of microphones and performs a synchronous subtraction of input
voice signals of the microphone array or the plurality of the microphones
30 with respect to a direction of the loudspeaker so as to cancel out an echo
signal outputted from the loudspeaker.

18. The echo canceling system according to claim 1, wherein the speaker can choose execution or suspension of the echo canceling processing by the echo canceling processing portion and of the sound characteristics detecting processing of the echo path by the sound characteristics detecting portion.

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19. An echo canceling processing program realizing an echo canceling processing for a full-duplex communication system, the program comprising program codes of:

10 a sound characteristics detecting processing operation for detecting sound characteristics information of an echo path seen from a speaker side; and

15 an echo canceling processing operation for canceling an echo included in a signal returned from a system on a conversation partner side based on the sound characteristics information detected in the sound characteristics detecting processing operation;

wherein those operations will be performed in a communication system not on the conversation partner side but on the speaker side.